☆ يتكون الامتحان من (4) اسئلة في عدد (6) صفحات

☆ اجابة السؤال الأول و الثاني و الثالث في ال **ANSWER TABLES** المخصص لذلك

Question No. I **{30 Marks}**

Choose the correct answer for each question. Record your choice in the answer table.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
a	d	a	d	d	a	b	d	c	a	c	a	b	b	d

1- ω-Conotoxin was the lead drug for

a- Ziconotide b- Brevetoxin c- Cigutoxin d- Tetrodotoxin

2- Depsipeptides

a- Amino acids chain b- Amino acids + carboxylic acids chain

c- Amides and carboxylic groups **d- b & c**

3- Marine biotechnology

a- Culture-independent method b- Interaction between creatures

c- Poisonous materials d- None of the above

4- Marine toxins

a- Moray eel b- Jelly fish c- Maito fish **d- All of the above**

5- Overcoming bacterial resistance

a- Phage lysins b- Facilitate entrance of antibiotic

c- Bacterial cell death **d- All of the above**

6- Trabectedin {Yondelis™]

a- Safracin B b- Mitosis

c- DNA polymerase d- anti-metabolite

7- Elemental analysis

a- C=O groups **b- Percentage elements**

c- OH groups d-3D Structure

8- Coelenterazine

a- Luciferin b- Fluorescent Jelly fish

c- Cardiac output **d- All of the above**

9- Genetic code

a- Three nucleotides b- Part of DNA

c- Sequence of nucleotides d- None of the above

10- Endonucleases

a- Cleave DNA at specific sites b- Isolate DNA

c- Cleave RNA at specific sites d- RNA lysis

11- Recombinant DNA technology

a- Cleaves DNA cleavage b- DNA isolation

c- Cut up and join together genetic material d- Nucleotides sequence

12- X-ray crystallography

a- Structure and stereochemistry b- Types of protons

c- Types of carbons d- Unsaturations

13- Gene guns

a- Natural engineers **b- Biolistic particle delivery**

c- Cleave DNA d- Cut up and join genetic material

14- Metagenomics

a- RNA isolation **b- DNA isolation**

c- Gene identification d- Hereditary characters

15- Bioassay-guided fractionation

a- Assay or multiple assays b- Testing preliminary fractions

c- Testing the crude extract **d- All of the above**

Question No. II **{30 Marks}**

Match the scientific term number in **column A** with the letter equivalent to definition in **column B.** Record the chosen letter in the following table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
g	o	j	k	h	c	d	l	b	n	m	f	e	a	i

Column A	Column B
1- Drug resistance	a- Ca^{++} channels blocker on the neurons in the spinal cord
2- Tetrodotoxin	b- Gene isolation and transfer to *E. coli* or yeast
3- Azotemia	c- Acts as DNA alkylating in colorectal cancer
4- Therapeutic polypeptides	d- Treatment of Herpes and Chickenpox
5- Eribulin	e- Apoptosis in Pancreatic cancer
6- Trabectedin	f- Drug inspired from Dolastatin 10
7- Vidarabine	g- Marine Natural Products {MNPs} Development
8- *Agrobacterium tumifaciens*	h- Structural trimming of Halichondrin B
9- Biotechnology	i- Growing large number of M.O. in short time
10- Gene hunting	j- Diving deeper than 100 feet in Ocean's water
11- Codon	k- Preserved in lyophilized state at low temperature
12- Brentuximab	l- Natural genetic engineer
13- Aplidin	m- Triplet of nucleotides
14- Ziconotide	n- Gene finding
15- HTPS	o- 3000 times more active than morphine as pain killer

Question No. III **{15 Marks}**

State if the following statements are true {T} or false {F}. Record your choice in the answer table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
T	F	T	F	T	F	T	F	T	T	F	T	F	F	F

1- Marine pharmaceuticals are characterized by wide chemical diversity

2- EIMS is more preferable than ESIMS in analysis of polypeptides

3- Brine shrimp toxicity is an important step in isolation of bioactive marine drugs

4- During extraction, purifications and isolation, polypeptides are stable

5- Structural trimming of some marine natural products may be applied

6- Few bioactive marine compounds fail in the clinical trials phases

7- Omega-3 fatty acids esters are more preferable than omega-6 fatty acids esters

8- Inorganic solvents are usually used in extraction of marine drugs

9- Scientists must know how to culture marine organisms in the laboratory.

10- Blue green algae are also given the name cyanobacteria.

11- In biotechnology, genetic code is specific for each genus

12- Marine polypeptides are considered as the drugs of future

13- It doesn't matter for scientists to know a background about marine creatures taxonomy

14- Ciguatoxin can be used as an alternative to digoxin {digitalis}

15- Scientists had many other choices than to carry out total synthesis of Eribulin {Halaven}

Question No. IV **{5 Marks}**

Rationalize the following statements

1- Marine biotechnology will make production of new omega-3 fatty acids with 7 un-saturations easy.

This can be carried out by transfer of gene cluster producing omega-3 fatty acids with 7 unsaturations from diatoms to E- coli

2- Scientists couldn't isolate the gene cluster of Halichondrin B

Gene cluster for biosynthesis of Halichondrin couldn't be isolated from the true producers till now. Halichondrin B produced by the association between the different symbiont microorganisms.

3- Structural trimming may be needed in some marine drugs

Removal of certain part of the bioactive compound during chemical synthesis to decrease side effects, increase selectivity, decrease toxicity or increase bioavailability e.g. Structural trimming of Halichondrin B was carried out to obtain Eribulin.

4- Prialt is used in people who do not respond to standard pain-relieving medications e.g. Morphine

Ziconotide - Prialt is used to treat severe chronic pain in people who cannot use or do not respond to standard pain-relieving medications e.g. Morphine as it is not working centrally but by blocking voltage gated calcium channels in neurons

5- It is important to determine the stereochemistry of the amino acids in bioactive polypeptides

L-amino acids will be metabolized in human body but D-amino acids will not be metabolized and accumulate causing toxicity. During synthesis of the bioactive polypeptides we can replace D-amino acids by L-amino acids

Now, go to the sea

Relax, drink ice tea

انتهت الاسئلة

Best Wishes

Dr. Omar M. Sabry